

Claims

- [c1] A method for decoding compressed data, comprising:
receiving compressed data;
decoding the compressed data;
detecting an error while decoding a first location in the compressed data;
accessing a reentry data set having a pointer to a second location in the compressed data following the first location and decoding information that enables decoding to start from the second location;
accessing the second location in the compressed data; and
using the decoding information in the accessed reentry data set to continue decoding the compressed data from the second location.
- [c2] The method of claim 1, wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and historical information used to enable decoding the compressed data at the location addressed by the pointer.
- [c3] The method of claim 1, wherein there are a plurality of reentry data sets, each having a pointer to one location in the compressed data and decoding information that enables decoding to start from the location addressed by the pointer,
and wherein accessing the reentry data further comprises:
determining one of the reentry data sets.
- [c4] The method of claim 3, wherein determining one of the reentry data sets further comprises;
determining the reentry data set from the plurality of reentry data sets whose pointer addresses a closest location to the first location in the compressed data following the first location.
- [c5] The method of claim 1, wherein the compressed data is transmitted over a network from a transmitting system.
- [c6] The method of claim 5, further comprising:
sending a request to the transmitting system for a retransmission of

compressed data including the first location after detecting the error; receiving a block of the compressed data starting at a third location in the compressed data, wherein the pointer in one reentry data set addresses the third location, and wherein the block of the compressed data includes the first location; and using decoding information in the reentry data set having the pointer to the third location to decode the block of the compressed data including the first location.

- [c7] The method of claim 6 , wherein the block of the compressed data includes compressed data from the third location to the second location in the compressed data.
- [c8] The method of claim 6 , wherein the compressed data is being decoded by the receiver in parallel with receiving the data from the transmitting system.
- [c9] The method of claim 8 , further comprising:
receiving the block of compressed data and the reentry data set having the pointer to the third location in response to the request; and
receiving reentry data sets with compressed data after receiving the block of compressed data, wherein before the error was detected, the reentry sets were not transmitted with the compressed data.
- [c10] The method of claim 1 , wherein the compressed data is received from a storage medium.
- [c11] The method of claim 10 , wherein the compressed data is archived in the storage medium.
- [c12] The method of claim 10 , wherein the compressed data is received in response to a request from an application program or operating system process executing on a computing device.
- [c13] A method for caching data, comprising:
loading compressed data into cache from a non-volatile storage device, wherein reentry data sets each include a pointer to one location in the compressed data

and decoding information that enables decoding to start from the location; receiving a request for data, wherein the compressed data in the cache includes the requested data; and using the reentry data sets to decode only that portion of the compressed data in cache that includes the requested data.

- [c14] The method of claim 13, wherein if the requested data is not in uncompressed format in the cache, then further performing: determining a first location in the compressed data whose decoded output comprises the requested data; determining a reentry data set whose pointer addresses a second location in the compressed data preceding the first location; using the decoding information in the determined reentry data set to decode the compressed data from the second location through the first location to output the requested data in uncompressed format; and returning the requested data in the uncompressed format.
- [c15] The method of claim 14, wherein determining the reentry data set whose pointer addresses the second location further comprises: determining the reentry data set from the plurality of reentry data sets whose pointer addresses a closest location in the compressed data to the first location that precedes the first location.
- [c16] The method of claim 13, wherein the cache comprises a volatile memory that is capable of processing Input/Output (I/O) operations faster than the non-volatile storage device.
- [c17] The method of claim 13, wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and probability estimates used to enable decoding the compressed data at the location addressed by the pointer.
- [c18] A method for transmitting data in a compressed format, comprising: transmitting compressed data to a receiving device; transmitting a reentry data set to the receiving device having a pointer to a

location in the compressed data and decoding information that enables decoding to start from the location, wherein the receiving device is capable of using the decoding information in the reentry data set to decode the compressed data from the location addressed by the pointer in the reentry data set.

- [c19] The method of claim 18 , wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and probability estimates used to enable decoding the compressed data at the location addressed by the pointer.
- [c20] The method of claim 18 , wherein the compressed data is transmitted over a network.
- [c21] The method of claim 18 , further comprising:
receiving a request from the receiving system for a retransmission of a portion of the compressed data; and
transmitting a block of the compressed data including the requested portion of the compressed data, wherein the pointer in one reentry data set addresses a beginning of the block of the compressed data and includes decoding information to decode the block of the compressed data.
- [c22] The method of claim 21 , wherein the block of the compressed data includes compressed data between locations addressed by pointers in two reentry data sets.
- [c23] The method of claim 21 , wherein the receiving device decodes the compressed data in parallel with receiving the data from the transmitting device.
- [c24] The method of claim 23 , further comprising:
transmitting the reentry data set having the pointer to the beginning location in the block of the compressed data in response to the request; and
transmitting reentry data sets with the compressed data after transmitting the block of compressed data, wherein before the request was received the reentry sets were not transmitted with the compressed data.

- [c25] A system for decoding compressed data, comprising:
means for receiving compressed data;
means for decoding the compressed data;
means for detecting an error while decoding a first location in the compressed data;
means for accessing a reentry data set having a pointer to a second location in the compressed data following the first location and decoding information that enables decoding to start from the second location;
means for accessing the second location in the compressed data; and
means for using the decoding information in the accessed reentry data set to continue decoding the compressed data from the second location.
- [c26] The system of claim 25, wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and historical information used to enable decoding the compressed data at the location addressed by the pointer.
- [c27] The system of claim 25, wherein there are a plurality of reentry data sets, each having a pointer to one location in the compressed data and decoding information that enables decoding to start from the location addressed by the pointer,
and wherein the means for accessing the reentry data further performs:
determining one of the reentry data sets.
- [c28] The system of claim 25, wherein the compressed data is transmitted over a network from a transmitting system, further comprising:
means for sending a request to the transmitting system for a retransmission of compressed data including the first location after detecting the error;
means for receiving a block of the compressed data starting at a third location in the compressed data, wherein the pointer in one reentry data set addresses the third location, and wherein the block of the compressed data includes the first location; and
means for using decoding information in the reentry data set having the pointer to the third location to decode the block of the compressed data including the

first location.

[c29] The system of claim 28 , wherein the compressed data is being decoded by the receiver in parallel with receiving the data from the transmitting system.

[c30] A system for caching data from a non-volatile storage device, comprising:
a cache;
means for loading compressed data into cache from the non-volatile storage device, wherein reentry data sets each include a pointer to one location in the compressed data and decoding information that enables decoding to start from the location;
means for receiving a request for data, wherein the compressed data in the cache includes the requested data; and
means for using the reentry data sets to decode only that portion of the compressed data in cache that includes the requested data.

[c31] The system of claim 30 , further comprising:
determining a first location in the compressed data whose decoded output comprises the requested data if the requested data is not in uncompressed format in the cache;
determining a reentry data set whose pointer addresses a second location in the compressed data preceding the first location if the requested data is not in uncompressed format in the cache;
using the decoding information in the determined reentry data set to decode the compressed data from the second location through the first location to output the requested data in uncompressed format; and
returning the requested data in the uncompressed format.

[c32] A system for transmitting data in a compressed format to a receiving device, comprising:
means for transmitting compressed data to the receiving device;
means for transmitting a reentry data set to the receiving device having a pointer to a location in the compressed data and decoding information that enables decoding to start from the location, wherein the receiving device is capable of using the decoding information in the reentry data set to decode the

compressed data from the location addressed by the pointer in the reentry data set.

- [c33] The system of claim 32 , further comprising:
means for receiving a request from the receiving system for a retransmission of a portion of the compressed data; and
means for transmitting a block of the compressed data including the requested portion of the compressed data, wherein the pointer in one reentry data set addresses a beginning of the block of the compressed data and includes decoding information to decode the block of the compressed data.
- [c34] The system of claim 32 , wherein the receiving device decodes the while being transmitted.
- [c35] The system of claim 34 , further comprising:
means for transmitting the reentry data set having the pointer to the beginning location in the block of the compressed data in response to the request; and
means for transmitting reentry data sets with the compressed data after transmitting the block of compressed data, wherein before the request was received the reentry sets were not transmitted with the compressed data.
- [c36] An article of manufacture including code for decoding compressed data, wherein the code causes operations to be performed, the operations comprising:
receiving compressed data;
decoding the compressed data;
detecting an error while decoding a first location in the compressed data;
accessing a reentry data set having a pointer to a second location in the compressed data following the first location and decoding information that enables decoding to start from the second location;
accessing the second location in the compressed data; and
using the decoding information in the accessed reentry data set to continue decoding the compressed data from the second location.
- [c37] The article of manufacture of claim 36 , wherein the decoding information

includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and historical information used to enable decoding the compressed data at the location addressed by the pointer.

- [c38] The article of manufacture of claim 36, wherein there are a plurality of reentry data sets, each having a pointer to one location in the compressed data and decoding information that enables decoding to start from the location addressed by the pointer, and wherein accessing the reentry data further comprises:
determining one of the reentry data sets.
- [c39] The article of manufacture of claim 38, wherein determining one of the reentry data sets further comprises;
determining the reentry data set from the plurality of reentry data sets whose pointer addresses a closest location to the first location in the compressed data following the first location.
- [c40] The article of manufacture of claim 36, wherein the compressed data is transmitted over a network from a transmitting system, further comprising:
sending a request to the transmitting system for a retransmission of compressed data including the first location after detecting the error;
receiving a block of the compressed data starting at a third location in the compressed data, wherein the pointer in one reentry data set addresses the third location, and wherein the block of the compressed data includes the first location; and
using decoding information in the reentry data set having the pointer to the third location to decode the block of the compressed data including the first location.
- [c41] The article of manufacture of claim 40, wherein the compressed data is being decoded by the receiver in parallel with receiving the data from the transmitting system.
- [c42] An article of manufacture including code for caching data, wherein the code causes operations to be performed, the operations comprising:

loading compressed data into cache from a non-volatile storage device, wherein reentry data sets each include a pointer to one location in the compressed data and decoding information that enables decoding to start from the location; receiving a request for data, wherein the compressed data in the cache includes the requested data; and using the reentry data sets to decode only that portion of the compressed data in cache that includes the requested data.

- [c43] The article of manufacture of claim 42, wherein if the requested data is not in uncompressed format in the cache, then further performing: determining a first location in the compressed data whose decoded output comprises the requested data; determining a reentry data set whose pointer addresses a second location in the compressed data preceding the first location; using the decoding information in the determined reentry data set to decode the compressed data from the second location through the first location to output the requested data in uncompressed format; and returning the requested data in the uncompressed format.
- [c44] The article of manufacture of claim 43, wherein determining the reentry data set whose pointer addresses the second location further comprises: determining the reentry data set from the plurality of reentry data sets whose pointer addresses a closest location in the compressed data to the first location that precedes the first location.
- [c45] The article of manufacture of claim 42, wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and probability estimates used to enable decoding the compressed data at the location addressed by the pointer.
- [c46] An article of manufacture including code for transmitting data in a compressed format to a receiving device, wherein the code causes operations to be performed, the operations comprising: transmitting compressed data to a receiving device; transmitting a reentry data set to the receiving device having a pointer to a

location in the compressed data and decoding information that enables decoding to start from the location, wherein the receiving device is capable of using the decoding information in the reentry data set to decode the compressed data from the location addressed by the pointer in the reentry data set.

- [c47] The article of manufacture of claim 46, wherein the decoding information includes decoded data preceding output produced by decoding the compressed data at the location addressed by the pointer and probability estimates used to enable decoding the compressed data at the location addressed by the pointer.
- [c48] The article of manufacture of claim 46, wherein the compressed data is transmitted over a network, further comprising:
receiving a request from the receiving system for retransmission of a portion of the compressed data; and
transmitting a block of the compressed data including the requested portion of the compressed data, wherein the printer in one reentry data set addresses a beginning of the block of the compressed data and includes decoding information to decode the block of the compressed data.
- [c49] The article of manufacture of claim 48, wherein the receiving device decodes the while being transmitted, further comprising:
transmitting the reentry data set having the pointer to the beginning location in the block of the compressed data in response to the request; and
transmitting reentry data sets with the compressed data after transmitting the block of compressed data, wherein before the request was received the reentry sets were not transmitted with the compressed data.